

Notice of Allowability

Application No.

10/810,815

Examiner

Mariceli Santiago

Applicant(s)

SHINODA ET AL.

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed January 5, 2005.
2. ☒ The allowed claim(s) is/are 1-12, 15-33, 35-53 and 56-80.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 08/010,169.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 3/29/2004
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Response to Amendment

The Amendment, filed on January 5, 2005, has been entered and acknowledged by the Examiner.

Cancellation of claims 13, 14, 34, 54 and 55 has been entered.

Claims 1-12, 15-33, 35-53 and 56-80 are pending in the instant application.

Allowable Subject Matter

Claims 1-12, 15-33, 35-53 and 56-80 are allowed over the prior art of record.

The following is an examiner's statement of reasons for allowance:

Regarding claims 1-8, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 1, and specifically comprising the limitations of a cavity bounded by a pair of opposing and spaced sidewalls of respective barriers, formed on a first substrate, extending commonly with the pair of sidewalls in a first direction, the barriers having respective flat top portions having a width not less than 7.5 μ m in a second direction, and a phosphor layer within the cavity on one of the first and second substrates, the phosphor layer having a thickness in a range of from 10 μ m to 50 μ m. Claims 2-8 are allowable for the reasons given in claim 1 because of their dependency status from claim 1.

Regarding claims 9-12 and 15-19, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 9, and specifically comprising the limitation of a cavity bounded by respective opposing and spaced sidewalls of a pair of barriers formed on a first substrate, the barriers having respective flat top portions having a width of not less than 7.5 μ m in the second direction, an address electrode on the first substrate,

Art Unit: 2879

extending in the first direction, a pair of display electrodes formed on a surface of a second substrate covered by an insulating layer and positioned in opposed relationship with the address electrode, the pair of display electrodes extending in the second direction and defining the discharge cell. Claims 10-12 and 15-19 are allowable for the reasons given in claim 9 because of their dependency status from claim 9.

Regarding claims 20 and 21, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 20, and specifically comprising the limitation of a cavity bounded by respective opposing and spaced sidewalls of barriers formed on a first substrate and extending in the first direction, the barriers having respective flat top portions of a width not less than $7.5\mu\text{m}$ in the second direction, an address electrode on the first substrate extending in the first direction, a pair of display electrodes formed on a second substrate, covered by a dielectric layer and arranged to constitute a corresponding row of the array in opposed relationship with the cavity, and a phosphor layer disposed on an inside surface of the cavity on the first substrate with a thickness in a range of $10\mu\text{m}$ - $50\mu\text{m}$.

Regarding claims 22-29, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 22, and specifically comprising the limitation of a cavity bounded by respective opposing and spaced sidewalls of a pair of barriers superposed on a first substrate, the cavity extending commonly with the pair of barriers in a first direction, the barriers having respective flat top portions of a width not less than $7.5\mu\text{m}$ in a second direction, an address electrode superposed on the first substrate, adjacent a bottom of the cavity and extending in the first direction, a pair of display electrodes superposed on a surface of a second substrate, covered by an insulating layer and positioned in opposed relationship with respect to the address electrode, the pair of display electrodes extending in the second direction, transversely to and crossing the barriers and the cavity therebetween, and

Art Unit: 2879

defining the discharge cell, and a phosphor layer disposed within the cavity and superposed on one of the first and second substrates, the phosphor layer having a thickness in a range of from 10 μm to 50 μm . Claims 23-29 are allowable for the reasons given in claim 22 because of their dependency status from claim 22.

Regarding claims 30-33 and 35-39, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 30, and specifically comprising the limitation of a cavity bounded by respective opposing and spaced sidewalls of a pair of parallel barriers superposed on a first substrate, the cavity extending commonly with the pair of barriers in the first direction, the barriers having respective flat top portions of a width not less than 7.5 μm in the second direction, an address electrode superposed on the first substrate, adjacent a bottom of the cavity and extending in the first direction, a pair of display electrodes superposed on a second substrate covered by an insulating layer and positioned in opposed relationship with respect to the address electrode, the pair of display electrodes extending in a second direction, transversely to and crossing the pair of barriers and the cavity therebetween, and defining the discharge cell. Claims 31-33 and 35-39 are allowable for the reasons given in claim 30 because of their dependency status from claim 30.

Regarding claims 40 and 41, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 40, and specifically comprising the limitation of a cavity, bounded by respective opposing and spaced sidewalls of a pair of spaced barriers superposed on the first substrate and extending in the first direction, the barriers having respective flat top portions of a width not less than 7.5 μm in the second direction, an address electrode superposed on the first substrate, adjacent a bottom of the cavity and extending in the first direction, a pair of display electrodes superposed on the second substrate, covered by a dielectric layer and arranged to constitute a corresponding row of the

Art Unit: 2879

array in opposed relationship with the cavity, and a phosphor layer within the cavity of a thickness in a range of 10 μm -50 μm .

Regarding claims 42-49 and 51, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 42, and specifically comprising the limitation of a cavity bounded at least in part by respective cavity sidewalls supported by a first substrate, said cavity sidewalls having respective flat top portions of a width not less than 7.5 μm in a second direction, an address electrode supported by the first substrate, aligned with the cavity and extending in a first direction, a pair of display electrodes supported by a second substrate, covered by an insulating layer and positioned in opposed, spaced relationship with respect to a portion of the aligned address electrode and defining the discharge cell therebetween, the display electrode extending in the second direction. Claims 43-49 and 51 are allowable for the reasons given in claim 42 because of their dependency status from claim 42.

Regarding claims 50, 52, 53 and 56-59, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 50, and specifically comprising the limitation of a cavity bounded at least in part by a respective cavity sidewall supported by a back substrate, the cavity sidewalls having a flat top portion of a width not less than 7.5 μm in the second direction, an address electrode supported by the back substrate, aligned with the cavity and extending in the first direction, a pair of display electrodes supported by a front substrate, covered by an insulating layer and positioned in opposed, spaced relationship with respect to, and extending in a second direction and crossing, a portion of the aligned address electrode and defining the discharge cell therebetween. Claims 52, 53 and 56-59 are allowable for the reasons given in claim 50 because of their dependency status from claim 50.

Regarding claims 60 and 61, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 60, and specifically comprising the limitation of a cavity, bounded by respective cavity sidewalls, supported by the back substrate, an address electrode supported by the back substrate, aligned with the cavity and extending in the first direction, a pair of display electrodes supported by the front substrate, covered by a dielectric layer and arranged to constitute a corresponding row of the array in opposed relationship with the cavity, and a phosphor layer within the cavity, supported by the back substrate, and having a thickness in a range of 10 μm -50 μm , and each of the sidewalls has a flat top portion of a width not less than 7.5 μm in the second direction.

Regarding claims 62-66, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 62, and specifically comprising the limitation of discharge spaces defined by surfaces of respective sidewalls supported by the rear substrate, the discharge spaces extending in a first direction and arranged in parallel spaced relationship in a second direction transverse to the first directions on the rear substrate, the sidewalls having a flat top portion of a width not less than 7.5 μm which contact with an inner surface of the front substrate, respective phosphor layers covering respective bottom and sidewall surfaces of the discharge spaces on the rear substrate; and address electrodes corresponding to respective phosphor layers and supported on the rear substrate, portions of each address electrode underlying respective bottoms of the discharge spaces being aligned in a common one of the first and second transverse directions. Claims 63-66 are allowable for the reasons given in claim 62 because of their dependency status from claim 62.

Regarding claims 67-69, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 67, and specifically comprising the limitation of barriers separating the gas discharge space into a plurality of discharge cells on

Art Unit: 2879

each display line, at an array pitch of the address electrodes, each discharge cell being defined at a portion where a respective display electrode pair and a respective address electrode cross each other, the barriers being formed on the second substrate with a height substantially corresponding to a gap length of the gas discharge space and each of the barriers having a flat top portion of a width not less than 7.5 μm in the first direction and a bottom portion of a width wider than the width of the top portion. Claims 68 and 69 are allowable for the reasons given in claim 67 because of their dependency status from claim 67.

Regarding claims 70-72 and 74-80, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 70, and specifically comprising the limitation of a pair of display electrodes supported by a front substrate, covered by an insulating layer and positioned in an opposed, spaced relationship with respect to a portion of the aligned address electrode and defining the discharge cell therebetween, the pair of display electrodes having a pair of projection portions of a transparent conductor forming a discharge gap at a selected portion of the discharge cell and a pair of metal layer strips extending in a lateral direction transverse to the vertical direction, and a phosphor layer disposed within the cavity and formed on the cavity sidewall and on the portion of the aligned address electrode, wherein each of the sidewalls has a flat top portion of a width not less than 7.5 μm and a bottom portion of a width wider than the top portion. Claims 71, 72 and 74-80 are allowable for the reasons given in claim 70 because of their dependency status from claim 70.

Regarding claim 73, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 73, and specifically comprising the limitation of barriers separating the gas filled space into a plurality of discharge cells on each display line, at an array pitch of the address electrodes, each of the discharge cell being defined at a portion where a respective display electrode pair and a respective address electrode cross each other, the barriers being formed only on the second substrate with a height substantially corresponding

Art Unit: 2879

to a gap length of the gas filled space and each of the barriers having a flat top portion of a width not less than 7.5 μm in the first direction and a bottom portion of a width wider than the width of the top portion.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mariceli Santiago whose telephone number is (571) 272-2464. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Mariceli Santiago
Primary Examiner
Art Unit 2879